



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,477	03/11/2004	Kee-Yean Ng	70030733-1	7408

57299 7590 03/23/2006  
AVAGO TECHNOLOGIES, LTD.  
P.O. BOX 1920  
DENVER, CO 80201-1920

EXAMINER

QUARTERMAN, KEVIN J

ART UNIT	PAPER NUMBER
----------	--------------

2879

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/798,477

Applicant(s)

NG ET AL.

Examiner

Kevin Quarterman

Art Unit

2879

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 06 March 2006 has been entered.

### ***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-13 are rejected under 35 U.S.C. 102(e) as being anticipated by Reeh (US 6,576,930).

4. Regarding independent claim 1, Figure 3 of Reeh shows a light-emitting diode display device comprising a substrate (2); a plurality of walls (8) disposed on the substrate, the plurality of walls forming a cavity (9), the cavity being filled with an encapsulant (15), the encapsulant not including fluorescent material; an LED (1) disposed on a first portion (2) of the substrate within the cavity; an electrical connection

(14) between the LED and a second portion (3) of the substrate; and a fluorescent material overlay (4) at a top end of the cavity, wherein the fluorescent material overlay has a thickness capable of substantially fully converting all light emitted from the LED to fluorescent radiation (col. 3, ln. 42-50).

5. Regarding claim 2, Figure 3 of Reeh shows the fluorescent material overlay including a layer of phosphor particles (6).

6. Regarding claim 3, Figure 3 of Reeh shows the fluorescent material overlay having a substantially consistent thickness and includes a substantially uniform matrix of phosphor particles (see also col. 3, ln. 42-45).

7. Regarding claim 4, Reeh discloses the fluorescent material overlay including a combination of two or more fluorescent material types (col. 4, ln. 53-57).

8. Regarding claim 5, Reeh discloses the fluorescent material overlay including phosphor particles having a mean diameter within the range of 1 micrometer to 50 micrometer (col. 6, ln. 1-2).

9. Regarding claim 6, Reeh discloses the fluorescent material overlay including phosphor particles having a mean diameter within the range of 10nm to 100nm (col. 9, ln. 1-5).

10. Regarding claim 7, Reeh discloses the fluorescent material overlay may include an organic dye (col. 9, ln. 24-28).

11. Regarding independent claim 8, Figure 3 of Reeh shows a light-emitting diode display device comprising a substrate (2); a plurality of walls (8) disposed on the substrate, the plurality of walls forming a cavity (9); an LED (1) disposed on a first

Art Unit: 2879

portion (2) of the substrate within the cavity; an electrical connection (14) between the LED and a second portion (3) of the substrate; and a fluorescent material overlay (4, 29) at a top end of the cavity, the fluorescent material overlay having an area including a layer of fluorescent material (4, 6) disposed over only a portion of the area, wherein another portion of the area (29) does not have any fluorescent material (see also col. 12, ln. 51-67).

12. Regarding claim 9, Figure 3 of Reeh shows the fluorescent material overlay having a substantially consistent thickness and includes a substantially uniform matrix of phosphor particles.

13. Regarding claim 10, Reeh discloses the fluorescent material overlay including a combination of two or more fluorescent material types (col. 4, ln. 53-57).

14. Regarding claim 11, Reeh discloses the fluorescent material overlay including phosphor particles having a mean diameter within the range of 1 micrometer to 50 micrometer (col. 6, ln. 1-2).

15. Regarding claim 12, Reeh discloses the fluorescent material overlay including phosphor particles having a mean diameter within the range of 10nm to 100nm (col. 9, ln. 1-5).

16. Regarding claim 13, Reeh discloses the fluorescent material overlay may include an organic dye (col. 9, ln. 24-28).

***Claim Rejections - 35 USC § 103***

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2879

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

19. Claims 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isoda (US 6,774,406) in view of Reeh (US 6,576,930).

20. Regarding independent claim 14, Figures 1 and 3 of Isoda show a light-emitting diode display device comprising a substrate (1); a plurality of cavities (1c), each of the plurality of cavities formed within a plurality of walls (1c) disposed on the substrate; a plurality of LEDs (3), each of the plurality of LEDs disposed within a separate one of the plurality of cavities, each of the plurality of LEDs disposed on a first portion of the substrate; and a plurality of electrical connections (6) connecting one of the plurality of LEDs to one or more respective second portions (1a, 1b) of the substrate.

21. Isoda teaches the limitations of independent claim 14 discussed earlier but fails to exemplify a fluorescent material overlay at a top end of the cavities.

22. In Figure 3, Reeh teaches that it is known in the art to provide light-emitting diode display devices with a fluorescent material overlay (4) at a top end of a cavity (9) for ensuring a uniform color of radiated light (col. 3, ln. 42-43).

23. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide a fluorescent material overlay, as taught by Reeh, at a top end of the cavity of Isoda for converting light emitted by the LED to fluorescent radiation.

24. Regarding claim 15, Figure 3 of Reeh shows the fluorescent material overlay including a layer of phosphor particles (6).

25. Regarding claim 16, Figure 3 of Reeh shows the fluorescent material overlay having a substantially consistent thickness and includes a substantially uniform matrix of phosphor particles.

26. Regarding claim 17, Reeh discloses the fluorescent material overlay including phosphor particles having a mean diameter within the range of 1 micrometer to 50 micrometer (col. 6, ln. 1-2).

27. Regarding claim 18, Reeh discloses the fluorescent material overlay including phosphor particles having a mean diameter within the range of 10nm to 100nm (col. 9, ln. 1-5).

28. Regarding claim 19, Reeh discloses the fluorescent material overlay may include an organic dye (col. 9, ln. 24-28).

29. Regarding claim 20, Reeh discloses the fluorescent material overlay also including a plurality of fluorescent material types (col. 4, ln. 53-62), while Figure 3 of

Isoda show fluorescent material (5) included in a corresponding portion or portions of the plurality of cavities (1c).

### ***Response to Arguments***

30. Applicant's arguments received 26 October 2005 have been fully considered but they are not persuasive.

31. In response to applicant's argument, regarding independent claim 1, that Reeh does not disclose anything about the effect of the thickness of the conversion layer on light conversion, the Examiner respectfully disagrees. The Examiner notes that Reeh discloses that the conversion layer has a constant thickness throughout, thereby ensuring a uniform color of radiated light (col. 3, ln. 42-45). The Examiner also notes that in the instant application, applicant discloses the fluorescent material overlay having substantially consistent thickness for keeping the proportion of the LED radiation that is converted to fluorescent material radiation constant (pg. 5, ln. 25-27). Thus, the Examiner holds that Reeh does indeed teach the effect of the thickness of the conversion layer on light conversion.

32. In response to applicant's argument that Reeh does not teach a thickness sufficient to ensure that substantially all of the light emitted by the LED is converted, the Examiner notes that applicant does not disclose any particular thickness of the fluorescent material overlay but only discloses that the thickness is substantially consistent and that the thickness may vary. Since Reeh discloses the conversion layer having a constant thickness (col. 3, ln. 42-45) as well as a conversion having a varying



Art Unit: 2879

thickness (col. 2, ln. 6-11), the Examiner holds that Reeh teaches each of the claimed structural limitations of independent claim 1, as discussed earlier.

33. In response to applicant's argument that Reeh does not teach only a portion of the overlay including the fluorescent material, the Examiner respectfully disagrees.

Applicant notes that the region in Figure 3 of Reeh labeled "4" and the region "29" are coextensive areas, not portions of the same area. The Examiner notes that the "area" of the fluorescent overlay would include the area bounded by the conversion layer (4) in addition to the area bounded by the glass covering (29). The conversion layer (1<sup>st</sup> portion of the area) includes fluorescent material, while the glass covering (2<sup>nd</sup> portion of the area) does not. Thus, the Examiner holds that Reeh does indeed teach only a portion of the overlay including the fluorescent material, as claimed in independent claim 8.

34. Applicant's arguments with respect to claim 14 have been considered but are moot in view of the new ground(s) of rejection.

**Contact Information**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Quarterman whose telephone number is (571) 272-2461. The examiner can normally be reached on M-TH (7-5:30).

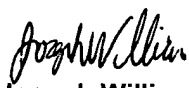
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin Quarterman  
Examiner  
Art Unit 2879

kq 

16 March 2006

  
Joseph Williams  
Primary Examiner  
Art Unit 2879